NITROGEN

PHOSPHATE

POTASH

THE FERTILIZER SUPPLY 1977-78

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List of Tables

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THE FERTILIZER SUPPLY, 1977-78 1/

SUMMARY

Net domestic supplies of fertilizer plant nutrients--nitrogen (N), phosphate (P_2O_5), and potash (K_2O)--in the 1977-78 fertilizer year are expected to total 23.1 million short tons. This is 2 percent less than last year's supply and 10 percent more than the supply 2 years ago.

Estimated supplies of N total 11,945,000 short tons, up 5 percent from last year's total and more than 13 percent above the supply 2 years ago. Natural gas curtailments have been less severe than during the past 2 years. However, a number of plants have been shut down and many others have been operating at minimum rates because of inventory problems - no place to store full production. New plants which came on stream during calendar year 1977 swelled capacity about 16 percent. Production of nitrogenous fertilizers, for which anhydrous ammonia is the basic raw material, is expected to exceed last year's production for all materials except solid ammonium nitrate and ammonium sulfate. Movement of urea, nitrogen solutions, and anhydrous ammonia for direct application will determine production levels.

Phosphate supplies are expected to total 5,334,000 short tons of P_2O_5, down 5 percent from the level a year ago but up 2 percent from the total 2 years ago. Movement of phosphatic fertilizer has allowed reasonably good operating rates during the first half of the fertilizer year. Capacity for producing concentrated phosphatic materials is adequate. Detecting signals for production changes in time to avoid further imbalance in the market is the key.

Potash aupplies are expected to total 5,853,000 short tons of K_2O, 11 percent less than supplies a year ago and up 10 percent from the level 2 years ago. Imports of potassium chloride are expected to be 2 percent less than total imports last year. Supply from domestic production is expected to be 21 percent less than the supply last year. Potassium sulfate supplies are expected to be down 30 percent from the level a year ago.

Beginning inventories (July 1, 1977) were at record levels for most kinds of fertilizers and have continued to be above levels of last year through the first half of this fertilizer year. Thus, production rates during the last half of the year are dependent on movement of materials and limits of storage capabilities. Sensitivity to both domestic and international market conditions is essential if industry instability is to be minimized.

1/ The fertilizer year is from July 1 through June 30.

Current weather forecasts point toward lower than normal temperatures well into the spring over the Great Plains, the South, and the Southeast. Field activities are likely to be unseasonably slow in most areas east of the Rockies. The planting season of short duration could very well begin in the South, the Southeast, and the Corn Belt at about the same time. This would complicate further the problem of restocking dealers' fertilizer inventories, and producers would deliver less fertilizer than they would otherwise.

Data in tables 1A, 2A, and 3A are in metric tons and are a duplication of tables 1, 2, and 3 which are in short tons. Tables 19, 20, and 21 are also in metric tons. The discussion refers to short tons unless metric tons are specified.

NITROGEN (N)

Net domestic supplies of nitrogen (N) for fertilizer use are expected to total 11,945,000 tons in the 1977-78 fertilizer year. This is about 5 percent more than was available last year and 13 percent above supplies 2 years ago (table 1). Supplies from domestic production are estimated to exceed last year's level by about 4 percent, with imports up about 10 percent and exports up about 7 percent.

Natural gas curtailments - Anhydrous ammonia producers lost, because of natural gas curtailments, only 47 percent as much production through February as for the same period a year ago. The natural gas industry and anhydrous ammonia producers were better prepared to deal with the problem than they were last year. Expanded capacity could more than offset the loss. However, inventories at the beginning of the year were at record levels and plants operated at reduced rates during the first half of the fertilizer year because of limited storage.

Supply from domestic production - Supplies of N from domestic production are expected to total 11,263,000 tons (table 1). The supply of liquid nitrogen, estimated to be about two-thirds of the total domestic supply of N, is expected to be 7,284,000 tons, up 8 percent over last year's supply. Anhydrous ammonia shipped as such for fertilizer use is expected to be about 3 percent less than shipments last year and over 8 percent less than the amount shipped 2 years ago. Production of all other liquid nitrogen is expected to increase by about 27 percent.

Domestic production of solid nitrogen is estimated to total 3,979,000 tons in the current fertilizer year, representing a 2 percent decrease in the amount produced a year ago. Ammonium nitrate supplies are expected to be down about 8 percent from last year, ammonium sulfate down 7 percent, and solid urea for fertilizer use up about 4 percent. Production of other solid nitrogen-bearing materials, largely ammonium phosphates, is estimated to exceed last year's level by about 2 percent.

Table 1.--Nitrogen: Estimated supply of N for fertilizer purposes, United States, fertilizer years, 1975-76, 1976-77, and 1977-78

Item	1975-76 1/	1976-77 1/	1977-78	Percent change in 1977-78 from	
				1976-77	1975-76
	1,000 Short tons	1,000 Short tons	1,000 Short tons	Percent	Percent
Supply from domestic production:					
Liquids:					
Ammonia (including aqua)	4,594	4,327	4,207	- 3	- 8
All other	2,220	2,415	3,077	+ 27	+ 39
Total liquids	6,814	6,742	7,284	+ 8	+ 7
Solids:					
Ammonium nitrate 2/ 3/	1,265	1,160	1,065	- 8	- 16
Ammonium sulfate 3/	562	539	501	- 7	- 11
Urea	941	937	973	+ 4	+ 3
All other solids 4/	990	1,413	1,440	+ 2	+ 45
Total solids	3,758	4,049	3,979	- 2	+ 6
Total liquids and solids	10,572	10,791	11,263	+ 4	+ 7
Imports:					
Ammonia (including aqua)	630	794	1,041	+ 31	+ 65
Nitrogen solutions	56	133	150	+ 13	+168
Ammonium nitrate	99	116	129	+ 11	+ 30
Ammonium sulfate	88	95	72	- 24	- 18
Urea 3/	189	526	447	- 15	+137
Sodium nitrate	14	22	27	+ 23	+ 93
All other	142	154	150	- 3	+ 6
Total	1,218	1,840	2,016	+ 10	+ 66
Exports:					
Ammonia (including aqua)	264	362	362	0	+ 37
Ammonium nitrate	21	4	4	0	- 81
Ammonium sulfate	158	103	106	+ 3	- 33
Urea	267	169	186	+ 10	- 30
All other	529	611	676	+ 11	+ 28
Total	1,239	1,249	1,334	+ 7	+ 8
Net domestic supply	10,551	11,382	11,945	+ 5	+ 13

1/ Revised.
2/ Includes ammonium nitrate and ammonium nitrate-limestone mixtures.
3/ Adjusted for estimated quantity going into nonfertilizer uses.
4/ To avoid duplication, the figure for "all other solids" has been adjusted by the estimated amount of imported ammonia used in primary materials.

Table 1A--Nitrogen: Estimated supply of N for fertilizer purposes, United States, fertilizer years, 1975-76, 1976-77, and 1977-78

Item	1975-76 1/	1976-77 1/	1977-78	Percent change in 1977-78 from 1976-77	Percent change in 1977-78 from 1975-76
	1,000 Metric tons	1,000 Metric tons	1,000 Metric tons	Percent	Percent
Supply from domestic production:					
Liquids:					
Ammonia (including aqua)	4,168	3,925	3,817	- 3	- 8
All other	2,014	2,191	2,791	+ 27	+ 39
Total liquids	6,182	6,116	6,608	+ 8	+ 7
Solids:					
Ammonium nitrate 2/ 3/	1,148	1,052	966	- 8	- 16
Ammonium sulfate 3/	510	489	454	- 7	- 11
Urea	854	850	883	+ 4	+ 3
All other solids 4/	898	1,282	1,306	+ 2	+ 45
Total solids	3,410	3,673	3,609	- 2	+ 6
Total liquids and solids	9,592	9,789	10,217	+ 4	+ 7
Imports:					
Ammonia (including aqua)	572	720	944	+ 31	+ 65
Nitrogen solutions	51	121	136	+ 13	+168
Ammonium nitrate	90	105	117	+ 11	+ 30
Ammonium sulfate	80	86	65	- 24	- 18
Urea 3/	171	477	405	- 15	+137
Sodium nitrate	13	20	24	+ 23	+ 93
All other	129	140	136	- 3	+ 6
Total	1,106	1,669	1,827	+ 10	+ 66
Exports:					
Ammonia (including aqua	239	328	328	0	+ 37
Ammonium nitrate	19	4	4	0	- 81
Ammonium sulfate	143	93	96	+ 3	- 33
Urea	242	153	169	+ 10	- 30
All other	480	554	613	+ 11	+ 28
Total	1,123	1,132	1,210	+ 7	+ 8
Net domestic supply	9,575	10,326	10,834	+ 5	+ 13

1/ Revised.
2/ Includes ammonium nitrate and ammonium nitrate-limestone mixtures.
3/ Adjusted for estimated quantity going into nonfertilizer uses.
4/ To avoid duplication, the figure for "all other solids" has been adjusted by the estimated amount of imported ammonia used in primary materials.

Imports - Total nitrogen imports for the fertilizer year are estimated to be about 2,016,000 tons of N, 10 percent more than total imports in 1976-77. Imports of anhydrous ammonia are estimated to be 31 percent greater than last year's total and 65 percent above the level of 2 years ago. Other major imports such as nitrogen solutions, ammonium nitrate, and sodium nitrate are expected to exceed last year's levels by 13, 11, and 23 percent, respectively. A decrease of 24 percent is expected for ammonium sulfate and 15 percent for urea compared with last year's total.

Exports - Nitrogen exports will total around 1,334,000 tons of N, about 7 percent more than exports last year. Anhydrous ammonia and ammonium nitrate exports are expected to be about the same as those of last year. Ammonium sulfate exports are expected to be about 3 percent more than the total last year. Urea exports are also expected to be up about 10 percent, while all other materials are expected to be up 11 percent.

Nitrogen capacities - Domestic anhydrous ammonia production capacity was estimated at 22.7 million tons of anhydrous ammonia (NH_3) on January 1, 1978, an increase of about 16 percent from 1977.

Urea capacity was estimated to be 7.2 million tons of material, about 8 percent above a year ago. Ammonium nitrate capacity was estimated to be 9.3 million tons. About 1.2 million tons of ammonium nitrate is used to produce industrial material. The 8.1 million tons which is used for making fertilizer grade material is divided into about 62 percent solid and 38 percent liquid.

PHOSPHATE (P_2O_5)

Net domestic supplies of phosphate (P_2O_5) are expected to total 5,334,000 tons in the 1977-78 fertilizer year, about 5 percent less than was available last year but 2 percent more than the amount 2 years ago (table 2). Imports are estimated to be 229,000 tons of P_2O_5, down 8 percent from imports in 1976-77 but up 4 percent from those in 1975-76. Exports are expected to total 2,649,000 tons of P_2O_5, up 6 percent from the total a year ago and 22 percent above the total in 1975-76.

Normal superphosphate - Total supplies of normal and enriched superphosphate from domestic production are estimated to total 292,000 tons of P_2O_5, about 22 percent less than last year's supply (table 2). Imports and exports will be negligible.

Table 2.--Phosphate: Estimated supply of P_2O_5 for fertilizer purposes, United States, fertilizer years, 1975-76, 1976-77, and 1977-78

Item	1975-76 1/	1976-77 1/	1977-78	Percent change in 1977-78 from	
				1976-77	1975-76
	1,000 Short tons	1,000 Short tons	1,000 Short tons	Percent	Percent
Supply from domestic production:					
Normal and enriched superphosphate	414	376	292	- 22	- 29
Concentrated superphosphate	1,662	1,750	1,725	- 1	+ 4
Ammonium phosphate 2/	3,380	4,066	4,406	+ 8	+ 30
All other 3/	1,743	1,668	1,331	- 20	- 24
Total	7,199	7,860	7,754	- 1	+ 8
Imports:					
Concentrated superphosphate	15	23	29	+ 26	+ 93
Ammonium phosphate	146	166	153	- 8	+ 5
All other	60	59	47	- 20	- 22
Total	221	248	229	- 8	+ 4
Exports:					
Normal superphosphate	4	1	1	0	- 75
Concentrated superphosphate	563	571	543	- 5	- 4
Ammonium phosphate	1,216	1,416	1,600	+ 13	+ 32
All other	392	511	505	- 1	+ 29
Total	2,175	2,499	2,649	+ 6	+ 22
Net domestic supply	5,245	5,609	5,334	- 5	+ 2

1/ Revised.
2/ Liquid and solid ammonium phosphate, excluding those combined with potash salts in the process of manufacture.
3/ Includes nitric phosphates, sodium phosphate, wet base goods, natural organics, phospnate rock, colloidal phosphate, basic slag, estimates of wet-process and furnace phosphoric acid for liquid and solid mixed fertilizers, and direct application, and ammonium phosphates combined with potash salts in the process of manufacture.

Table 2A--Phosphate: Estimated supply of P_2O_5 for fertilizer purposes, United States, fertilizer years, 1975-76, 1976-77, and 1977-78

Item	1975-76 1/	1976-77 1/	1977-78	Percent change in 1977-78 from 1976-77	Percent change in 1977-78 from 1975-76
	1,000 Metric tons	1,000 Metric tons	1,000 Metric tons	Percent	Percent
Supply from domestic production:					
Normal and enriched superphosphate	376	341	265	- 22	- 24
Concentrated superphosphate	1,508	1,588	1,565	- 1	+ 4
Ammonium phosphate 2/	3,066	3,689	3,997	+ 8	+ 30
All other 3/	1,581	1,513	1,207	- 20	- 24
Total	6,531	7,131	7,034	- 1	+ 8
Imports:					
Concentrated superphosphate	14	21	26	+ 26	+ 93
Ammonium phosphate	132	151	139	- 8	+ 5
All other	54	54	43	- 20	- 22
Total	200	226	208	- 8	+ 4
Exports:					
Normal superphosphate	4	1	1	0	- 75
Concentrated superphosphate	511	518	493	- 5	- 4
Ammonium phosphate	1,103	1,285	1,451	+ 13	+ 32
All other	356	464	458	- 1	+ 29
Total	1,974	2,268	2,403	+ 6	+ 22
Net domestic supply	4,757	5,089	4,839	- 5	+ 2

1/ Revised.

2/ Liquid and solid ammonium phosphate, excluding those combined with potash salts in the process of manufacture.

3/ Includes nitric phosphates, sodium phosphate, wet base goods, natural organics, phosphate rock, colloidal phosphate, basic slag, estimates of wet-process and furnace phosphoric acid for liquid and solid mixed fertilizers, and direct application, and ammonium phosphates combined with potash salts in the process of manufacture.

Concentrated superphosphate - Supplies of concentrated superphosphate from domestic production are expected to total 1,725,000 tons of P_2O_5, 1 percent less than the supply last year. Imports are estimated to be about 26 percent above last year's level. Exports are expected to be about 5 percent less.

Ammonium phosphate - Domestic supplies of ammonium phosphate are expected to total 4,406,000 tons of P_2O_5, 8 percent more than the total in 1976-77 and 30 percent more than the total 2 years ago. Imports are estimated to be about 8 percent less than imports last year, and exports about 13 percent more.

Phosphoric acid - Wet-process phosphoric acid is the basic P_2O_5 material used in the manufacture of high-analysis phosphatic fertilizers. Production is about the same as it was last year. The rate of use of this acid in concentrated phosphatic fertilizer materials and shipments to other fertilizer producers for further processing during the second half of the 1977-78 fertilizer year will determine changes in the operating rate from that of the first half.

Supplies of phosphoric acid available for sale (estimated to be about 25 percent of production) to primary fertilizer producers without phosphoric acid facilities, and to secondary fertilizer producers, continues to be a major segment of the total P_2O_5 supply. Secondary manufacturers use phosphoric acid to produce solid mixtures, solid N-P base materials (including ammonium phosphate), liquid N-P base materials (including ammonium phosphate and ammonium polyphosphate), liquid mixed fertilizers, and an insignificant amount for direct application.

Phosphate capacities - Normal superphosphate capacity in operating plants was estimated to be about 660,000 tons of P_2O_5 on January 1, 1978. Concentrated superphosphate capacity was estimated to be 2.3 million tons of P_2O_5.

Ammonium phosphate capacity in plants operated by primary producers was estimated to be about 5.1 million tons of P_2O_5, about 6 percent above last year's capacity. Available information is not sufficient to reliably estimate capacity of other plants operated by secondary producers which manufacture ammonium phosphate primarily for their own use in mixed fertilizers (solid and liquid) and liquid ammonium polyphosphate.

Wet-process phosphoric acid capacity in operating plants was estimated to be 9.4 million tons of P_2O_5, about 6 percent above total tonnage a year ago. Some of the new jumbo plants are not yet operating at rated capacity.

The above estimates of P_2O_5 capacities are based on current production of phosphatic materials. However, capacities may shift, within limits, from one material to another since phosphoric acid is the basic P_2O_5 source for the production of all concentrated phosphatic materials except nitric phosphate.

Within limits, market conditions govern division of the output of phosphoric acid into concentrated superphosphate, various grades of ammonium phosphate, liquid base N-P materials, or sales of phosphoric acid to secondary fertilizer manufacturers.

POTASH (K_2O)

Net domestic supplies of potash (K_2O) in 1977-78 are expected to total 5,853,000 tons, 11 percent less than supplies last year and 10 percent more than supplies 2 years ago (table 3). Imports are expected to total 4,837,000 tons of K_2O, down 2 percent from the level in 1976-77. Exports are expected to be 988,000 tons of K_2O, 1 percent less than the previous year's total.

Potassium chloride - Supplies of domestically produced potassium chloride (muriate of potash) are expected to total 1,655,000 tons of K_2O (table 3), about 21 percent less than last year's total and 13 percent less than that of 2 years ago. Imports are expected to be down about 2 percent, and exports down 1 percent. If exports are subtracted from domestic production, only 17 percent of the net domestic supply will be from domestic production. Practically all of the remaining 83 percent will be imported from Canada.

Potassium sulfate - Supplies of potassium sulfate and potassium magnesium sulfate from domestic production are expected to total 314,000 tons of K_2O in 1977-78, 30 percent less than last year's supply and 18 percent less than the supply 2 years ago. Imports are expected to be down about 24 percent and exports down about 5 percent.

Potash capacities - U.S. potash production capacity was estimated to be 2,850,000 tons of K_2O as of January 1, 1978.

Canadian capacity was estimated to be about 8.6 million tons of K_2O. The Provincial Government of Saskatchewan has purchased three mines and their facilities and is reported to be negotiating with other potash companies as a part of its plan to own and control 50 percent or more of the potash industry in the Province.

Table 3.--Potash: Estimated supply of K_2O for fertilizer purposes, United States, fertilizer years, 1975-76, 1976-77, and 1977-78

Item	1975-76 1/	1976-77 1/	1977-78	Percent change in 1977-78 from	
				1976-77	1975-76
	1,000 Short tons	1,000 Short tons	1,000 Short tons	Percent	Percent
Supply from domestic production:					
Potassium chloride	1,893	2,098	1,655	- 21	- 13
Potassium sulfate 2/	385	451	314	- 30	- 18
All other	35	35	35	0	0
Total	2,313	2,584	2,004	- 22	- 13
Imports:					
Potassium chloride	3,849	4,888	4,770	- 2	+ 24
Potassium sulfate 2/	32	46	35	- 24	+ 9
All other	29	21	32	+ 52	+ 10
Total	3,910	4,955	4,837	- 2	+ 24
Exports:					
Potassium chloride	725	791	799	- 1	+ 10
Potassium sulfate 2/	166	175	166	- 5	0
All other	20	28	23	- 18	+ 15
Total	911	994	988	- 1	+ 8
Net domestic supply	5,312	6,545	5,853	- 11	+ 10

1/ Revised.
2/ Includes potassium-magnesium sulfate.

Table 3A--Potash: Estimated supply of K_2O for fertilizer purposes, United States, fertilizer years, 1975-76, 1976-77, and 1977-78

Item	1975-76 1/	1976-77 1/	1977-78	Percent change in 1977-78 from	
				1976-77	1975-76
	1,000 Metric tons	1,000 Metric tons	1,000 Metric tons	Percent	Percent
Supply from domestic production:					
Potassium chloride	1,717	1,903	1,501	- 21	- 13
Potassium sulfate 2/	349	409	285	- 30	- 18
All other	32	32	32	0	0
Total	2,098	2,344	1,818	- 22	- 13
Imports:					
Potassium chloride	3,492	4,434	4,327	- 2	+ 24
Potassium sulfate 2/	29	42	32	- 24	+ 9
All other	26	19	29	+ 52	+ 10
Total	3,547	4,495	4,388	- 2	+ 24
Exports:					
Potassium chloride	658	718	725	- 1	+ 10
Potassium sulfate 2/	151	159	150	- 5	0
All other	18	25	21	- 18	+ 15
Total	827	902	896	- 1	+ 8
Net domestic supply	4,818	5,937	5,310	- 11	+ 10

1/ Revised.
2/ Includes potassium-magnesium sulfate.

INVENTORIES

Inventories of nitrogen and phosphate materials are reported monthly by the Bureau of the Census. Inventories of each nitrogenous material are stocks held by producing companies at plants and other locations.

Phosphate material inventories are the stocks at producing locations only. Monthly potash inventories are not available from Government sources. Data are not available on inventories held by secondary manufacturers, distributors, and dealers.

Nitrogen - The inventory of anhydrous ammonia at the end of June 1977 was 1,087,871 tons, down 24 percent from total tons in 1976, and down 4 percent from the tonnage in 1975 (table 4). The inventory of anhydrous ammonia at the end of December 1977, the middle of the current fertilizer year, was a record level of 2,784,785 tons--up 24 percent from that of December 1976, and up 35 percent over the level 2 years ago.

Stocks of ammonium nitrate in June 1977 were 30 percent above stocks in 1976, but 45 percent below the record level for this date in 1975. Nitrogen solutions in June 1977 were also 67 percent above the total in 1976, but 7 percent less than that of 1975.

Phosphate - The June 1977 wet-prcess phosphoric acid inventory was up 34 percent from the inventory of 1976 but still 29 percent below that of 2 years ago (table 4).

June 1977 stocks of total phosphates were 8 percent less than stocks in 1976, and down 34 percent from the 1975 record level of 649,644 tons. June 1977 inventories of normal and concentrated superphosphates were down 26 percent and 4 percent, respectively, from 1976 inventories, and were at about one-half the near record levels of 1975.

FOREIGN TRADE IN FERTILIZER

U.S. imports - Seventy-eight percent of total fertilizer imports came from Canada in 1976-77 (table 5). Nearly 84 percent of this Canadian total was potassium chloride. U.S. companies, or their subsidiaries in Canada, and subsidiaries of Canadian companies in the United States are responsible for a large share of the imports. Countries other than Canada are the major sources of imported ammonium nitrate-limestone, nitrogen solution, urea, calcium nitrate, potassium nitrate, potassium-sodium nitrate, potassium sulfate, and sodium nitrate. Mexico continues to be the major import source of phosphoric acid (see footnote 1, table 5).

Table 4.--Inventories of selected fertilizer materials, United States, end of June, December, and February 1/

Material	Unit	Beginning inventory			Mid-fertilizer year inventory			Inventory build-up for spring season	
		For end of June			For end of December			For end of February	
		1975	1976	1977	1975	1976	1977	1976	1977
Anhydrous ammonia	Tons of material	1,131,500	1,427,269	1,087,871	2,061,804	2,250,793	2,784,785	2,544,598	2,349,184
Ammonium nitrate, solid	"	224,584	95,937	124,536	330,305	278,402	391,971	295,259	243,191
Ammonium sulfate	"	172,753			284,405	174,965		294,600	210,689
Ammonium sulfate, coke oven	"	67,000	39,000		113,000	49,000		95,000	49,000
Nitrogen solutions	Tons of N	225,166	125,123	209,074	449,623	479,398	642,779	582,065	392,654
Phosphoric acid wet-process	Tons of P_2O_5	188,335	114,177	153,101	163,515	128,864	173,128	185,985	146,881
Total phosphates	"	649,644	466,063	428,179	541,301	469,253	572,722	663,691	388,417
Normal & enriched superphosphates	"	100,648	58,047	42,976	76,934	51,944	56,431	66,599	49,969
Concentrated superphosphates	"	254,029	132,064	127,495	168,024	129,270	177,734	183,293	126,340
Ammonium phosphates	"	263,300	257,716	242,928	261,204	267,837	322,586	378,633	195,679
Other phosphates	"	31,667	18,236	14,780	35,139	20,202	15,971	35,166	16,429

1/ Current Industrial Reports, Inorganic Fertilizer Materials and Related Acids, M28B, Bureau of the Census.

Table 5.--U.S. imports of selected fertilizer materials by country of origin, fertilizer year 1976-77 1/

Country of origin	Ammonium sulfate	Ammonium nitrate	Anhydrous ammonia	Urea	Calcium nitrate	Nitrogen solutions	Potassium chloride	Potassium sulfate	Potassium sodium nitrate	Mixed fertilizers
	Short tons of material									
Canada	199,623	263,522	489,822	425,294	1	65,587	7,982,795	1,278	959	104,725
Mexico		322	43,834							
Cuba							2,420			
Trinidad and Tobago	4,558		171,022	55,626						
Netherlands Antilles			73,450	6,017						
French West Indies			9,404	2,856						
Colombia			5,536							
Venezuela			36,006							
Chile									30,196	
Sweden					80	5,518				
Norway	39,983			60,075	67,893				7,898	19,695
Finland										15
United Kingdom			45,019	21,499	217	30,091	1			15
Netherlands	131,737	50,654	49,631	586,309		254,839				
Belgium	21,574	29,251		17,604	218	75,005		22,268		
France				1,257		13,131		18,860		
West Germany				116,394		8	39	36,096		317
East Germany							27,209			
Austria				26						
USSR							17,113			
Spain				22,253			42,290	2,700		
Italy	25,550			108,000				11,574		
Romania		3,180								
Switzerland										1
Iran			19,051							
Israel							138,968		6,895	
Kuwait			19,265							
Qatar				18,742						
India				2,873						
Thailand			5,493							
Rep. of China (Taiwan)										4,462
Japan	31,104			21,258		302			17	1
Total	454,129	346,929	967,533	1,466,083	68,409	444,481	8,210,835	92,776	45,965	129,231

1/ Other materials imported were the following: 67 tons dried blood; 6 tons manure, including guano; 1,517 tons calcium cyanamide; 138,904 tons sodium nitrate; 5,040 tons bone ash, dust, meal; 7,908 tons potassium nitrate; 60,782 tons ammonium nitrate-limestone; 56,627 tons phosphate crude, NES; 113,773 tons nitrogenous fertilizer NSPF; 52,364 tons liquid phosphatic fertilizer; 53,490 tons solid phosphatic fertilizer NSPF; 510 tons potassic fertilizer NSPF; 387,005 tons ammonium phosphates; and 109,744 tons fertilizer materials NSPF.

Imports of ammonium nitrate, ammonium nitrate-limestone, ammonium sulfate, anhydrous ammonia, nitrogen solution, sodium nitrate, urea, ammonium phosphate, phosphate crude, potassium chloride, potassium-sodium nitrate, potassium sulfate, and mixed fertilizer showed gains in 1976-77 over the previous year (table 6). Anhydrous ammonia imports have nearly tripled over the last 5 years. Imports of urea increased 64 percent over the level during 1975-76, the largest 1-year increase on record. In 1976-77, there were decreases in imports of calcium cyanamide, calcium nitrate, synthetic nitrogenous material not elsewhwere classified, and phosphoric acid.

U.S. exports - Phosphate rock exports increased nearly 9 percent in 1976-77 after having declined the previous 2 years (table 7). Canada and Japan took over 4.1 million tons, or 32 percent of the total. These two, with ten other countries took over 88 percent of the phosphate rock exports. In addition, the United Kingdom, India, and Italy took 288,000; 234,000; and 174,000 tons, respectively, of phosphate rock, or 5.5 percent of the total.

Concentrated superphosphate and potassium chloride exports in 1976-77 amounted to over 1 million tons and exports of ammonium phosphate totaled more than 3 million tons for the first time (table 8). Exports of nearly 500,000 tons of ammonium sulfate and 370,000 tons of urea were down 35 percent and 37 percent, respectively, the lowest in 4 years for ammonium sulfate and 3 years for urea.

Ammonium nitrate, ammonium sulfate, urea, and normal superphosphate were the only materials exported which did not show gains in 1976-77. Anhydrous ammonia exports increased slightly in 1976-77 after a 2-year decline. Exports of ammonium phosphate have increased 180 percent since 1970-71.

About 43 percent of all plant nutrients exported in 1976-77 (excluding phosphate rock) compared to 18 percent exported in 1975-76, went to countries with agricultural programs sponsored by the Agency for International Development (AID).

Over 85 percent of the phosphoric acid (fertilizer grade) exported, 66 percent of the ammonium sulfate, 52 percent of the urea, 50 percent of the potassium chloride, and 41 percent of the mixed fertilizer went to developing countries in which AID had active agricultural programs (table 7). AID financed fertilizer exports to only two of these countries. However, AID did not necessarily finance all of the fertilizer exported to these countries.

U.S. historical trade balance - The United States shifted from a net importer of nitrogen (N) to a net exporter in 1966 (table 9). The shift resulted primarily from the increased emphasis on the use of

Table 6.--U.S. imports of selected fertilizer materials, fertilizer years 1972-73 through 1976-77

Material	1972-73	1973-74	1974-75	1975-76	1976-77
	Short tons of material				
Ammonium nitrate	329,243	301,169	316,227	295,435	346,929
Ammonium nitrate-limestone	181	208,776	189,945	22,115	60,782
Ammonium sulfate	276,183	273,061	248,232	420,325	454,129
Anhydrous ammonia	343,087	437,639	598,292	766,761	967,533
Calcium cyanamide	3,761	3,299	58,550	37,570	1,517
Calcium nitrate	97,702	184,574	116,160	71,953	68,409
Nitrogen solutions	144,762	166,304	91,669	187,813	444,481
Sodium nitrate	74,558	99,863	201,520	89,098	138,904
Synthetic nitrogenous materials,nec	20,743	212,821	109,327	128,936	113,773
Urea	671,714	668,316	811,842	527,602	1,466,083
Ammonium phosphate	433,737	396,757	247,017	339,669	387,005
Phosphate, crude	43,112	163,956	79,879	35,505	56,627
Phosphoric acid	89,490	106,432	138,051	64,530	52,364
Potassium chloride	5,250,338	6,766,582	6,358,650	6,466,266	8,210,835
Potassium-sodium nitrate	37,783	47,404	16,387	39,414	45,965
Potassium sulfate	54,456	73,911	50,556	63,104	92,776
Mixed fertilizers	198,311	232,105	290,949	105,704	129,231

Table 7.--U.S. exports of selected fertilizer materials by country of destination, fertilizer year 1976-77 1/

Country of destination	Ammonium sulfate	Ammonium nitrate	Anhydrous Ammonia		Urea	Phosphate rock (all)	Normal super-phosphate	Concentrated super-phosphate	Ammonium Phosphate		Phosphoric acid (P_2O_5) (fert. grade)	Potassium chloride	Mixed fertilizers
			Fertilizer grade	Industrial					Diammonium phosphate	Other ammonium phosphate			
	Short tons of material												
Canada	40,581	6,435	20,346	2,170	52,420	2,553,203	6,714	24,652	145,974	53,476	13,331	6,404	76,598
Mexico	109,689	166	54,510	43,689	86,695	573,526	110				274	102,234	1,373
Guatemala 2/		74		98	2,976		213		6,784	9,331	10	3,125	5,292
El Salvador 2/	26,124	42	2,175	24	13,089	17,545			38,102	5,791	2	1,539	5,680
Nicaragua 2/	3,512		14	131	3,301	22		656	24,235	3,411	6	4,244	1,849
Costa Rica 2/			12,163	5,435	9,073	6,067	7	11,939	25,333	3,850		34,491	172
Jamaica	11,698	268	8	8		55		1,577	1,496			9,651	8
Dominican Republic 2/	74,258	1,151	120	129	4,123			12,934	24,301	10,404	11	21,861	7,972
Trinidad & Tobago			62,288					1,120	56		20	45	9
North America, other 4/	723	612	82	319	6,598	88		311	2,569	7,553	26	3,007	13,590
Colombia	169		11,297	24		39,688		10,779	2,219	42,412	21,025	11,177	41
Ecuador				10		17,227					42	2,755	3,456
Peru 2/	15,793	55				11,563		2,203				154	1,957
Chile						65		98,518	1,107		3		1
Brazil 2/	203,164		72,752	11,030	72,349	610,511		369,360	407,371	31,416	254,825	560,678	861
Uruguay 2/ 3/				1	2,386				54,981			551	433
Argentina	31			165	3,334			14,052	49,730	1,955	7	2,152	1,016
South America, other 4/	481	586	2		166	3,948		5,103	654	1,889	50	250	123
Sweden	54				74	118,494				12,111		31,811	16,543
Norway						123,900							
Denmark						14,550		12,072			9		68
United Kingdom			30,419	46,556		287,823			10,465			19,981	1,381
Ireland	4,616					40,656		47,174	29,872	6,613		11,935	
Netherlands				20		850,228					21,178	39	240
Belgium - Luxembourg				129		1,003,958		57,691	248,475			2,535	122
France		19	18			947,195		121,804	240,457		28		5,615
West Germany		14		483		920,524		44,752	21,692	6,706	8		8,145
East Germany						17,984							
Austria						104,151							1,027
Hungary								126,423					
Poland						749,928		20,923					
Spain			13,069	5,372		115,338		11,042	61,681				1,264
Portugal						9,753		5,498	11,230				6
Italy						173,642		27,575	279,289		10		95
Yugoslovia								81,079	122,118				
Romania						359,970							
Turkey				24,124					225,106		2,748		
Europe, other				89					17,352		3	17	607
Iran				1		358,544		266	24,871		5,306		1
Qatar						15,485							1
Afghanistan 2/									19,613				
India 2/		25		36	84,607	234,337			33,159		124,826		
Pakistan 2/ 3/									191,758				
Thailand 2/				2				4,286	26,828	193,097	3	55	66,395
Malaysia			3					1,322	2,205			17,495	19
Philippines 2/	30	1		21	2	140,123					35	19,334	30
China					25,841								
Korea, Republic of				126	182	727,536					29	50	
China, Taiwan				1	14	51,180				8	2	69,628	45
Japan				206	6	1,559,167		60,058	196,001	27,070	157	77,375	888
Asia, other	19		129	325	14	2		1,157	24,898	125	41	527	409
Australia				23				6,063	48,708		256	61,687	160
New Zealand		399		1					9,627	24,150	80	212,354	72
Oceania, other	15		1	85	26								125
Algeria			5,834					44,940	15,466				
Kenya 2/								12,135		12,103			
Africa, other 4/	41	1,218	5,833	13,939	649	22		2,723	35,840	32,617	162	7,283	31
Total	490,998	11,065	291,063	154,772	367,925	12,758,000	7,044	1,242,187	2,681,623	486,088	444,513	1,296,424	223,720
Countries with AID programs 2/	322,880	1,348	87,224	16,908	191,907	1,020,169	219	413,514	852,466	269,402	379,718	646,033	90,640
Percent to AID countries	66	12	30	11	52	8	3	33	32	55	85	50	41
Countries where AID financed at least part of fertilizers 3/				1	2,165				223,840			500	393

1/ Other exports: 1,206 tons sodium nitrate; 16,393 tons natural crude potash salts; 24,124 tons nitrogenous chemical fertilizer; 6,484 tons basic slag; 349,909 tons potassium chemical fertilizers, nec.; and 73,435 tons organic material.
2/ Countries with active AID agricultural programs.
3/ Countries which received AID financed fertilizer, but not necessarily all that was exported to each country.
4/ Includes AID and non-AID countries.

Table 8.--U.S. exports of selected fertilizer materials, fertilizer years 1972-73 through 1976-77

Material	1972-73	1973-74	1974-75	1975-76	1976-77
	Short tons of material				
Anhydrous ammonia					
Fertilizer, grade	693,857	532,067	276,840	254,554	291,063
Industrial	186,077	112,839	83,974	71,389	154,772
Ammonium nitrate	21,425	36,964	22,349	61,471	11,065
Ammonium sulfate	485,950	557,474	571,637	751,956	490,998
Sodium nitrate	1,233	566	3,799	959	1,206
Urea	522,976	322,524	449,982	580,524	367,925
Synthetic nitrogenous materials,nec	30,381	29,177	22,412	22,259	24,124
Phosphate rock	13,587,848	14,051,471	13,393,246	11,747,642	12,758,000
Normal superphosphate	46,712	25,114	21,023	22,104	7,044
Concentrated superphosphate	865,318	957,052	1,107,419	1,224,976	1,242,187
Ammonium phosphate	2,060,341	2,154,127	2,241,758	2,721,085	3,167,711
Potassium chloride	1,247,457	1,263,993	1,014,968	1,187,834	1,296,424
Potassium sulfate	240,306	272,345	350,144	332,518	349,909
Mixed fertilizers	372,692	437,247	496,896	218,175	223,720

Table 9.--U.S. imports and exports of primary plant nutrients, 1951-52 through 1977-78

Fertilizer	N		P_2O_5 1/		K_2O	
	Imports	Exports	Imports	Exports	Imports	Exports
	1,000 short tons					
1951-52	290	73	39	94	264	63
1952-53	429	44	41	74	159	54
1953-54	421	62	62	88	121	54
1954-55	373	141	61	154	139	91
1955-56	330	255	56	153	170	180
1956-57	294	268	54	256	179	315
1957-58	305	227	59	246	213	252
1958-59	294	223	64	204	238	310
1959-60	298	188	82	177	282	418
1960-61	276	213	67	238	285	484
1961-62	337	234	87	283	282	503
1962-63	344	196	117	275	486	411
1963-64	453	264	100	400	691	526
1964-65	470	392	98	432	884	625
1965-66	529	546	125	441	1,332	664
1966-67	669	749	165	787	1,643	678
1967-68	675	1,045	169	1,145	2,225	714
1968-69	690	1,594	183	995	1,944	798
1969-70	855	1,328	273	845	2,646	681
1970-71	929	1,077	283	898	2,510	620
1971-72	843	1,032	326	1,102	3,088	657
1972-73	882	1,508	312	1,422	3,192	922
1973-74	1,068	1,269	315	1,581	4,114	947
1974-75	1,198	1,115	274	1,861	3,847	848
1975-76	1,218	1,239	221	2,175	3,910	911
1976-77	1,841	1,250	248	2,500	4,955	994
1977-78 *	2,015	1,336	229	2,648	4,837	988

* Estimated.

Import Balance

Export Balance

1/ Excluding phosphate rock.

fertilizers in the AID program. A reduction in AID requirements in 1969-70 caused the first decline in N exports since 1962-63. The decline was reversed in 1972-73 by the worldwide food shortage and the need to increase food production. The United States became a net importer of N in 1974-75 due primarily to limited availability of foreign exchange for fertilizer purchases and world economic conditions. However, the United States shifted back to being a net exporter in 1975-76, but, as expected, became a net importer in 1976-77 and undoubtedly will continue as such in 1977-78.

U.S. exports accounted for about 49 percent of the processed fertilizer P_2O_5 in world trade in 1975-76. United States phosphate rock exports increased nearly 9 percent in 1976-77, after having dropped in 1975-76 to its lowest level in 5 years.

The United States had an export balance of K_2O from 1955-56 through 1961-62. Production from the then newly developed Canadian deposits shifted the net balance to imports in 1962-63. Since 1969-70, domestic production of potassium chloride (KCl) has been smaller than imports of KCl from Canada.

For the three primary fertilizer nutrients combined, the United States imported 7,044,000 tons and exported 4,744,000 tons in 1976-77, excluding phosphate rock. The United States is expected to import 7,081,000 tons and export 4,972,000 tons of these nutrients in 1977-78.

PRICES

Current and historical prices paid by farmers for fertilizer are available in "Agricultural Prices," Economics, Statistics, and Cooperatives Service, United States Department of Agriculture. Wholesale or producer prices are more difficult to find. The published price lists of producers or wholesalers have usually contained conditions for discount and freight equalization which made it difficult to determine net selling value f.o.b. plant. Further, it is difficult to determine the period for which the price lists are effective or when they are superseded. Some trade publications have listed wholesale prices with no indication of amount of discounts or freight equalization.

Data in tables 10 through 18 reflect the trend in prices realized by producers. The annual surveys of the industry conducted by the Bureau of the Census provide data on shipments and interplant transfers and value f.o.b. plant and in some cases commercial shipments and value. Prices per ton in these tables are based on these data.

Table 10--Anhydrous Ammonia - Shipments and interplant transfers, value f.o.b. plant and calculated price per ton 1/

Calendar Year	Shipments & interplant transfers			Commercial shipments only		
	Material (short tons)	Value 2/ (000 dollars)	Price/ ton	Material (short tons)	Value 2/ (000 dollars)	Price/ ton
1947	376,561	23,601	62.68	348,869	21,987	63.02
1950	636,828	51,326	80.60	424,679	36,126	85.07
1951	759,380	64,092	84.40	647,927	55,711	85.98
1952	966,936	82,267	85.08	741,762	64,945	87.56
1953	1,120,984	100,224	89.41	967,988	87,664	90.56
1954	1,284,894	114,836	89.37			
1955	1,553,651	130,710	84.13	1,330,417	114,047	85.72
1956	1,642,835	123,640	75.26	1,354,935	101,579	74.97
1957	1,744,564	123,726	70.92	1,437,924	102,611	71.36
1958	1,798,973	131,278	72.97	1,423,526	104,651	73.52
1959	2,202,081	153,196	69.57	1,778,692	124,153	69.80
1960	2,350,833	163,432	69.52	1,999,798	137,966	68.99
1961	2,565,926	184,305	71.83	2,172,537	155,317	71.49
1962	2,853,332	200,033	70.11	2,417,714	167,939	69.46
1963	3,464,766	238,655	68.88	3,039,728	207,498	68.26
1964	3,967,550	270,021	68.06	3,387,302	227,984	67.31
1965	4,881,116	329,242	67.45	4,090,552	273,380	66.83
1966	6,153,488	390,797	63.51	5,342,619	333,635	62.45
1967	6,964,998	381,878	54.83	5,885,139	327,112	55.58
1968	7,952,618	331,660	41.70	5,804,887	248,799	42.86
1969	8,467,690	288,067	34.02	6,134,697	208,826	34.04
1970	9,145,855	309,471	33.84	6,529,144	223,718	34.26
1971	9,453,063	322,049	34.07	6,462,896	227,267	35.16
1972	9,671,023	342,086	35.37	6,124,799	221,106	36.10
1973	9,266,090	395,469	42.68	6,429,478	289,147	44.97
1974	9,186,542	850,822	92.62	6,462,231	637,625	98.67
1975	9,157,261	1,392,366	152.05	6,952,726	1,057,014	152.03
1976	9,539,387	1,104,657	115.80	7,327,665	865,143	118.07

1/ Shipments and value from Inorganic Chemicals, Annual Reports, The Bureau of the Census, U.S. Department of Commerce.

2/ Value - Net selling value f.o.b. plant (after discounts and allowances and excluding freight charges which may be absorbed by the producer).

Table 11--Sulfuric acid, contact process gross 1/
Series MA-28A(74) Supp. 1

Calendar Year	Shipments & interplant transfers			Commercial shipments only		
	Material (short tons)	Value 2/ (000 dollars)	Price/ ton	Material (short tons)	Value 2/ (000 dollars)	Price/ ton
1947	5,161,795	67,749	13.13	4,849,659	63,093	13.01
1950	6,527,486	94,188	14.43	6,176,789	89,106	14.43
1951	6,694,552	113,394	16.94	6,399,831	108,992	17.03
1952	6,596,684	114,667	17.38	6,335,054	111,060	17.53
1953	7,079,036	132,351	18.70	6,864,586	128,835	18.77
1954	7,141,951	138,918	19.45	6,557,336	126,195	19.24
1955	8,847,877	170,954	19.32	8,332,981	161,005	19.32
1956	8,773,344	165,010	18.81	8,220,968	153,915	18.72
1957	8,828,072	162,422	18.40			
1958	8,621,570	157,694	18.29			
1959	9,419,531	179,071	19.01	8,707,692	165,454	19.00
1960	9,172,616	171,443	18.69	8,325,150	154,809	18.60
1961	9,175,683	164,738	17.95	8,331,599	149,839	17.98
1962	10,197,973	180,025	17.65	9,171,325	161,671	17.63
1963	10,838,408	186,037	17.16	9,719,200	166,513	17.13
1964	11,822,087	195,499	16.54			
1965	12,810,048	213,675	16.68	11,580,096	192,301	16.61
1966	13,911,314	240,997	17.32	12,639,292	218,239	17.27
1967	13,285,177	247,955	18.66	12,100,357	225,046	18.60
1968	12,735,800	269,757	21.18	11,433,100	241,817	21.15
1969	12,909,300	270,850	20.98	11,596,200	244,060	21.05
1970	13,065,500	248,878	19.05	11,601,600	199,488	17.19
1971	11,923,400	228,239	19.14	10,573,200	205,362	19.42
1972	13,038,000	237,722	18.23	11,726,800	216,773	18.49
1973	13,142,400	241,151	18.35	12,043,300	223,074	18.52
1974	13,695,800	319,631	23.34	12,611,800	294,940	23.39
1975	11,388,000	368,723	32.38	10,394,800	337,306	32.45
1976	12,056,600	373,984	31.02	11,632,100	342,514	29.45

1/ Shipments and value from Inorganic Chemicals, Annual Reports, The Bureau of the Census, U.S. Department of Commerce.

2/ Value - Net selling value f.o.b. plant (after discounts and allowances and excluding freight charges which may be absorbed by the producer).

Table 12--Ammonium nitrate (solution) (fertilizer grade) (100% NH_4NO_3) 1/

Calendar Year	Shipments & interplant transfers		
	Material (short tons)	Value 2/ (000 dollars)	Price/ ton
1954	40,378	2,220	54.98
1955	59,436	3,316	55.79
1956	72,907	3,734	51.22
1957	138,556	6,125	44.21
1958	64,589	3,591	55.60
1959	108,625	4,700	43.27
1960	98,080	4,792	48.86
1961	112,859	5,546	49.14
1962	115,637	5,989	51.79
1963	160,147	7,813	48.79
1964	265,515	14,568	54.87
1965	228,340	11,643	50.99
1966	240,855	12,111	50.28
1967	235,709	10,771	45.70
1968	255,760	9,297	36.35
1969	201,163	6,557	32.60
1970	262,461	12,756	48.60
1971	259,077	12,545	48.42
1972	232,372	11,967	51.50
1973	241,621	14,926	61.77
1974	285,881	23,747	83.07
1975	254,812	29,673	116.45
1976	237,540	28,733	120.96

Table 13--Ammonium nitrate (solid) (fertilizer grade) (100% NH_4NO_3) 1/

Shipments & interplant transfers		
Material (short tons)	Value 2/ (000 dollars)	Price/ ton
950,170	65,103	68.52
1,062,547	70,206	66.07
1,153,584	72,548	62.89
1,581,894	93,147	58.88
1,470,392	90,338	61.44
1,513,223	92,133	60.89
1,580,213	98,008	62.02
1,596,726	101,450	63.54
1,615,803	100,882	62.43
1,841,214	112,153	60.91
1,990,246	118,854	59.72
2,145,110	126,625	59.03
2,475,461	133,342	53.87
2,672,395	139,503	52.20
2,981,171	137,947	46.27
3,051,688	128,573	42.13
3,327,121	147,784	44.42
3,467,313	155,379	44.81
3,739,426	158,364	42.35
4,166,276	232,574	55.82
3,829,957	359,168	93.78
3,199,995	375,980	117.49
3,579,874	348,962	97.48

1/ Shipments and value from Inorganic Chemicals, Annual Reports, The Bureau of the Census, U.S. Department of Commerce.

2/ Value - Net selling value f.o.b. plant (after discounts and allowances and excluding freight charges which may be absorbed by the producer).

Table 14--Nitrogen solutions (100% N) 1/

Calendar Year	Shipments & interplant transfers: N (short tons)	Value 2/ (000 dollars)	Price/ ton
1947		4,736	
1950		5,247	
1951	341,213	39,088	114.56
1952	362,590	42,431	117.02
1953	356,965	44,301	124.10
1954	452,695	56,571	124.96
1955	464,282	57,324	123.47
1956	490,743	53,806	109.64
1957	538,193	60,464	112.35
1958	613,827	68,470	111.55
1959	749,118	86,652	115.67
1960	786,027	96,859	123.23
1961	795,463	105,305	132.38
1962	864,698	113,621	131.40
1963	1,050,498	125,171	119.15
1964	1,100,937	132.703	120.54
1965	1,061,014	137,138	129.25
1966	1,132,760	132,435	116.91
1967	1,464,574	163,738	111.80
1968	1,120,861	120,724	107.71
1969	1,423,220	120,958	84.99
1970	1,641,294	124,973	76.14
1971	1,255,808	104,733	83.40
1972	1,511,367	136,838	90.54
1973	1,849,898	196,142	106.03
1974	2,052,283	345,873	168.53
1975	1,948,302	448,495	230.20
1976	1,908,159	401,731	210.53

Table 15--Ammonium sulfate (other than coke-oven) 1/ (100% $(NH_4)_2 SO_4$)

Shipments & interplant transfers: Material (short tons)	Value 2/ (000 dollars)	Price/ ton
186,917	9,069	48.52
1,091,277	41,479	38.01
585,148	26,025	44.48
722,989	34,257	47.38
516,494	24,519	47.47
801,765	36,017	44.92
1,087,324	46,432	44.92
1,029,460	37,787	36.71
1,089,476	36,130	33.16
1,000,037	33,120	33.12
1,045,544	34,628	33.12
871,857	27,873	31.97
856,486	29,413	34.34
1,067,266	32,593	30.54
1,208,093	33,384	27.63
1,480,288	42,060	28.41
1,766,225	49,469	28.01
2,138,761	60,621	28.34
1,849,287	55,408	29.96
2,017,624	52,308	25.93
1,576,789	38,671	24.53
1,712,227	30,970	18.09
1,990,282	32,945	16.55
1,741,896	34,019	19.53
1,868,799	52,319	28.00
1,902,169	116,691	61.35
1,726,902	123,569	71.56
1,919,653	77,768	40.51

1/ Shipments and value from Inorganic Chemicals, Annual Reports, The Bureau of the Census, U.S. Department of Commerce.

2/ Value - Net selling value f.o.b. plant (after discounts and allowances and excluding freight charges which may be absorbed by the producer).

Table 16--Phosphoric acid total ($100\%\ P_2O_5$) 1/

Calendar Year	Shipments & interplant transfers		
	P_2O_5 (short tons)	Value 2/ (000 dollars)	Price/ ton
1947	35,546	5,766	162.21
1950	49,295	8,080	163.91
1951	67,251	12,131	180.38
1952	70,300	12,353	175.72
1953	105,762	17,504	165.50
1954	131,595	22,207	168.75
1955	161,085	26,281	163.15
1956	171,742	26,637	155.10
1957	217,427	33,445	153.82
1958	297,936	41,056	137.80
1959	344,454	51,222	148.70
1960	388,166	55,759	143.65
1961	382,743	53,580	139.99
1962	488,593	63,495	129.95
1963	613,660	76,547	124.74
1964	746,025	89,534	120.01
1965	918,499	101,743	110.77
1966	1,049,575	114,832	109.41
1967	1,076,718	120,261	111.69
1968	1,099,723	120,454	109.53
1969	1,463,781	143,895	98.30
1970	1,590,494	156,970	98.69
1971	1,784,752	164,427	91.87
1972	1,914,511	177,321	92.62
1973	1,958,732	208,808	106.60
1974	2,112,482	349,314	165.36
1975	2,357,127	426,098	180.77
1976	2,768,581	519,980	187.81

Table 17--Phosphoric acid, from phosphorous ($100\%\ P_2O_5$) 1/

Shipments & interplant transfers		
P_2O_5 (short tons)	Value 2/ (000 dollars)	Price/ ton
30,675	5,257	171.38
40,275	6,956	172.71
54,289	10,476	192.97
56,854	10,614	186.69
93,189	15,759	169.11
115,052	19,962	173.50
141,407	23,835	168.56
147,572	23,738	160.86
175,856	28,390	161.44
199,817	29,639	148.33
227,134	36,990	162.86
228,444	37,079	162.31
239,075	37,891	158.49
265,011	39,100	147.54
285,012	41,566	145.84
309,113	45,127	145.99
324,538	43,117	132.86
297,525	41,134	138.25
308,805	42,994	139.23
301,566	42,730	141.69
273,517	45,172	165.15
304,879	47,473	155.71
251,504	42,142	167.56
248,969	45,292	181.92
212,870	46,487	218.38
221,765	71,245	321.26
224,925	96,840	430.54
244,832	104,447	426.61

1/ Shipments and value from Inorganic Chemicals, Annual Reports, The Bureau of the Census, U.S. Department of Commerce.

2/ Value - Net selling value f.o.b. plant (after discounts and allowances and excluding freight charges which may be absorbed by the producer).

Table 18--Phosphoric acid, wet process (100% P_2O_5) 1/

Calendar Year	Shipments & interplant transfers			Commercial shipments only		
	P_2O_5 (short tons)	Value 2/ (000 dollars)	Price/ ton	P_2O_5 (short tons)	Value 2/ (000 dollars)	Price/ ton
1947	4,872	509	104.47			
1950	9,020	1,124	124.61			
1951	12,962	1,655	127.68			
1952	13,446	1,739	129.33			
1953	12,573	1,745	138.79			
1954	16,543	2,245	135.71			
1955	19,678	2,446	124.30			
1956	24,170	2,899	119.94			
1957	41,571	5,055	121.60			
1958	98,119	11,417	116.36			
1959	117,320	14,232	121.31	105,529	12,729	120.62
1960	159,722	18,680	116.95			
1961	143,668	15,689	109.20	108,682	11,945	109.91
1962	223,582	23,956	107.15	147,859	16,002	108.22
1963	328,648	34,981	106.44	243,089	25,430	104.61
1964	436,912	44,407	101.64	319,709	33,038	103.34
1965	593,961	58,626	98.70	414,414	41,043	99.04
1966	752,050	73,698	98.00	545,685	53,644	98.31
1967	767,913	77,267	100.62	537,296	53,035	98.71
1968	798,157	77,724	97.38	565,673	53,696	94.92
1969	1,190,624	98,723	82.92	961,043	77,957	81.12
1970	1,285,615	109,497	85.17	971,396	80,701	83.08
1971	1,533,248	122,285	79.76	1,194,602	94,345	78.98
1972	1,665,542	132,029	79.27	1,381,829	108,584	78.58
1973	1,745,862	162,321	92.97	1,487,591	144,067	96.85
1974	1,890,717	278,069	147.07	1,683,900	234,045	138.99
1975	2,132,202	329,258	154.42		291,180	
1976	2,523,749	415,533	164.65		375,171	

1/ Shipments and value from Inorganic Chemicals, Annual Reports, The Bureau of the Census, U.S. Department of Commerce.

2/ Value - Net selling value f.o.b. plant (after discounts and allowances and excluding freight charges which may be absorbed by the producer).

THE WORLD FERTILIZER MARKET

World food shortages have intensified the interest in fertilizer as a means of increasing crop yields and thereby increasing total food production. Fertilizer is an important means for increasing needed food production in developing as well as developed countries.

World production of primary plant nutrients totaled over 92 million metric tons 1/ in 1975-76 (latest year for which world fertilizer data are available), about the same as production in 1974-75 and about 30 percent more than output 5 years ago (tables 19, 20, and 21). Consumption totaled nearly 89 million metric tons in 1975-76, a 9 percent increase over consumption in 1974-75 and a 31 percent increase over the amount consumed 5 years ago.

The United States continues to rank number one in total use of each of the primary plant nutrients and the production of N and P_2O_5 in 1975-76. It produced 20 percent of the world's plant nutrients and used 21 percent of them in 1975-76.

Nitrogen (N) - In 1975-76, the United States produced 21 percent of the world's supply of N for fertilizer, consumed 22 percent, and ranked number three as an importer and number one as an exporter (table 19). China ranks number one as an importer and number three as a producer and consumer. Japan ranks number two as an exporter. The United States and USSR rank number one and two, respectively, as producers. Half of the top ten importers were developing countries. Japan, the Netherlands, and Belgium-Luxembourg each exported more N than was used at home.

Phosphate (P_2O_5) - The United States continued as the leading producer, consumer, and exporter of P_2O_5 (excluding phosphate rock) in 1975-76 (table 20). It produced 27 percent, exported 49 percent, and consumed 20 percent of the world's fertilizer P_2O_5. Five of the top ten importers are developing countries. Belgium-Luxembourg, the Netherlands, and Lebanon each exported more P_2O_5 than was used at home.

Potash (K_2O) - The United States ranked first as an importer, second as a consumer, but fourth as a producer and consumer of K_2O in 1975-76 (table 21). The USSR continued as the leading producer. In 1975-76, they became the leading consumer, and ranked second as an exporter.

Eleven countries are currently the world's significant sources of K_2O for fertilizers. Eighty-one percent of Canada's total exports of KCl went to the United States. East Germany exports about 75 percent, while Israel exports about 56 percent of its production. West Germany exports about 44 percent, while the USSR, the United States, France, Spain, and Italy export about a third of their production.

1/ Multiply metric tons by 1.1023 to convert to short tons.

Table 19.--Nitrogen: N production, consumption, and foreign trade by leading countries, 1975-76

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
United States	9,262,000	1	642,000 1/	3	937,000 1/	1	9,384,713	1
USSR	8,465,000	2	7,000 1/	-	414,000 1/	6	7,357,000	2
China	3,300,000 2/	3	1,255,000 2/	1	-------	-	4,555,000 2/	3
Japan	1,557,100	4	16,000 1/	-	851,300	2	638,100	-
Poland	1,532,601	5	6	-	361,493	7	1,223,676	7
India	1,508,000	6	950,817	2	-------	-	2,031,000	4
France	1,354,000 1/	7	477,000 1/	4	184,100 1/	-	1,707,800	5
Romania	1,292,000	8	-------	-	483,000 1/	5	788,000	10
West Germany	1,258,956	9	305,599	6	298,232	9	1,228,142	6
Netherlands	1,153,985	10	58,855	-	827,527	3	451,165	-
United Kingdom	1,055,000	-	120,000	-	86,000	-	1,045,000	8
Italy	999,685	-	134,491	-	259,094	10	724,337	-
Canada	916,000 1/	-	62,000 1/	-	353,000 1/	8	562,000 1/	-
Belgium-Luxembourg	609,961	-	131,007	-	519,349	4	182,000	-
Mexico	581,000 1/	-	248,800 1/	8	-------	-	833,000 1/	9
Viet Nam	-------	-	204,000 1/	10	-------	-	204,000 1/	-
Brazil	160,295	-	249,842	7	1,574	-	410,137	-
Egypt	150,540	-	221,000 1/	9	-------	-	415,000	-
Turkey	171,729	-	319,512	5	-------	-	452,620	-
Total, other	8,549,199	-	2,241,167	-	1,441,817	-	9,106,049	-
World Total	43,877,051		7,644,096		7,017,486		43,298,739	

1/ Unofficial figures.
2/ FAO estimate.

Source: Annual Fertilizer Review 1976, Food and Agriculture Organization of The United Nations.

Table 20.--Phosphate: P_2O_5 production, consumption, and foreign trade by leading countries, 1975-76

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
United States	6,655,000	1	170,000 1/	6	1,685,000 1/	1	4,731,167	1
USSR	4,103,000	-	25,600	-	99,100 1/	6	3,833,000	2
France	1,258,800 1/	-	512,100 1/	1	110,700 1/	5	1,618,300 1/	3
China	1,246,200 2/	-	14,600 2/	-	-------	-	1,253,400 2/	4
Poland	929,394	-	4,600 1/	-	11,300 1/	-	941,717	5
Canada	653,000 1/	-	96,600 1/	-	163,000 1/	3	526,000 1/	9
West Germany	648,961	-	175,625	5	57,558	10	779,684	7
Japan	585,300	-	40,700	-	16,200	-	623,600	8
Brazil	509,600 1/	-	405,300 1/	2	100 1/	-	914,800 1/	6
Belgium-Luxembourg	515,700 1/	-	64,642	-	467,753	2	143,942	-
United Kingdom	464,000	-	48,000	-	98,000	7	391,000	-
Romania	404,000	-	-------	-	68,900	8	338,000	-
Italy	369,518	-	333,672	3	20,329	-	489,642	10
India	320,000	-	326,041	4	-------	-	453,000	-
Hungary	206,010	-	150,000 1/	7	-------	-	429,340	-
South Korea	195,535	-	88,175	10	-------	-	236,422	-
Netherlands	177,589	-	28,339	-	159,500	4	79,139	-
Bangladesh	22,400 1/	-	100,800 1/	8	-------	-	51,000 1/	-
Pakistan	10,624	-	97,084	9	-------	-	101,266	-
Lebanon	67,500 1/	-	-------	-	61,800	9	5,000 1/	-
Total, other	3,148,758	-	944,222	-	352,183	-	3,715,856	-
World Total	24,871,034		3,761,224		3,470,837		24,045,180	

1/ Unofficial figures.
2/ FAO estimate.

Source: Annual Fertilizer Review 1976, Food and Agriculture Organization of The United Nations.

Table 21.--Potash: K_2O production, consumption, and foreign trade by leading countries, 1975-76

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
USSR	7,944,000	1	-------	-	2,490,000	2	4,997,000	1
Canada	4,841,700 1/	2	42,800 1/	-	4,262,700 1/	1	215,000 1/	-
East Germany	3,019,000	3	-------	-	2,252,000	3	706,500	6
United States	2,099,000	4	3,547,000	1	826,000	4	4,724,186	2
West Germany	1,848,447	5	85,709	-	819,414	5	1,099,003	5
France	1,734,000 1/	6	270,500 1/	9	616,600 1/	6	1,314,200	4
Israel	712,480	7	-------	-	399,055	7	17,775	-
Spain	512,355	8	14,000 1/	-	154,093	8	257,470	-
China	300,000 2/	9	155,400 2/	-	-------	-	401,400 2/	-
Congo	277,140	10	-------	-	-------	-	2,000 1/	
Italy	142,050	-	221,591	-	51,804	9	275,747	-
Poland	-------	-	1,587,900 1/	2	-------	-	1,490,889	3
Czechoslovakia	-------	-	690,000 1/	3	-------	-	667,000	7
Hungary	-------	-	598,200 1/	4	-------	-	553,094	9
Brazil	-------	-	587,670	5	-------	-	587,670	8
Japan	-------	-	545,700	6	-------	-	517,500	10
United Kingdom	-------	-	410,000	7	5,700 1/	10	399,000	-
Belgium	-------	-	281,900	8	-------	-	148,500	-
India	-------	-	264,236	10	-------	-	270,000	-
Total, other	46,619	-	2,871,482	-	10,320	-	2,693,118	-
World Total	23,476,791		12,174,088		11,887,686		21,337,052	

1/ Unofficial figures.
2/ FAO estimate.

Source: Annual Fertilizer Review 1976, Food and Agriculture Organization of The United Nations.

Of the major producers, Canada, East Germany, and Israel exported more K_2O than was used at home. Poland, Czechoslovakia, Hungary, Brazil, Japan, United Kingdom, Belgium-Luxembourg, and India, in that order, are the leading ten importers after the United States. The first five of these are among the top ten users of K_2O.

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